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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,622	05/14/2001	Kazuhiko Hayashi	NEC2370-US	7276

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EXAMINER	
RENNER, CRAIG A	

ART UNIT	PAPER NUMBER
2652	12

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/853,622	HAYASHI ET AL.	
	Examiner	Art Unit	
	Craig A. Renner	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *4-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 May 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Claims 11-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to one or more non-elected inventions/species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 9, filed 27 May 2003.

2. Applicant's election without traverse of "Species 1," upon which "Claims 1-3" are said to "read," in Paper No. 11, filed 3 September 2003, is acknowledged. Accordingly, claims 4-10 and 20-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to one or more non-elected inventions/species, there being no allowable generic or linking claim.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. The drawings are objected to because of the following informalities:

a. The drawings fail to comply with 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "wherein said

lower shield is made of a material of CoZrTa and CoZrTaCr alloy, as a base" (emphasis added) must be shown or the feature(s) canceled from the claim(s).

b. The drawings fail to comply with 37 CFR 1.84(p)(5) because they include one or more reference signs not mentioned in the description. Note, for instance, "10" (shown twice in each of Figs. 1 and 4-6, for instance) and "13" (shown twice in each of Figs. 1 and 4-6, for instance).

A proposed drawing correction, corrected drawings, and/or amendment to the specification/claims are required in reply to the Office action to avoid abandonment of the application. No new matter should be entered. The objection to the drawings will not be held in abeyance.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. The disclosure is objected to because of the following informalities:

Many reference signs in the specification do not correctly correspond with those shown in the figures. Note, by matter of example, for instance, the following:

a. In line 16 on page 15, "lower gap layer 3" should be --lower gap layer 2--.

b. In line 18 on page 15 and lines 1 and 9 on page 16, each instance of "base layer 3" should be --base layer 8--.

c. In line 18 on page 15 and lines 1-2, 9 and 26 on page 16, each instance of "free layer 8" should be --free layer 3--.

d. In line 21 on page 16, "lower gap 3" should be --lower gap 2--.

e. In line 21 on page 18, "upper shield 12" should be --upper shield 19--.

Appropriate correction is required.

7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. In line 8 of claim 1, it is indefinite as to whether "said fixed layer" refers to that set forth in line 6 of claim 1, or that set forth in line 7 of claim 1.

b. In lines 8-9 of claim 1, it is indefinite as to whether "said barrier layer" refers to that set forth in line 5 of claim 1, or that set forth in line 7 of claim 1.

c. Claims 2-3 inherit the indefiniteness associated with independent claim 1 and stand rejected as well.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Dill et al. (US 5,898,548).

Dill teaches a magnetoresistive effect sensor using a shielded-type magnetoresistive effect element comprising a magnetoresistive effect film (100) comprising a basic configuration that is either a combination of a free layer (132), a barrier layer (120) formed on the free layer, and a fixed layer (118) formed on the barrier layer, or a combination of a fixed layer (118), a barrier layer (120) formed on the fixed layer, and a free layer (132) formed on the barrier layer (as shown in FIGS. 4(A-B) and

5, for instance)), wherein a sensing current (I) flows substantially perpendicularly with respect to the magnetoresistive effect film (as shown in FIG. 4A, for instance), and wherein either an amorphous material or a microcrystalline material is used in a lower shield layer (S1, lines 40-44 in column 8, for instance, i.e., "CoZrNb" is an amorphous material, for instance).

11. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishiwata et al. (US 6,452,204).

Ishiwata et al. (US 6,452,204) teaches a magnetoresistive effect sensor using a shielded-type magnetoresistive effect element (as shown in Fig. 11, for instance) comprising a magnetoresistive effect film (100/Fig. 2C, for instance) comprising a basic configuration that is either a combination of a free layer (13), a barrier layer (15A) formed on the free layer, and a fixed layer (16) formed on the barrier layer, or a combination of a fixed layer (16), a barrier layer (15A) formed on the fixed layer, and a free layer (13) formed on the barrier layer (as shown in Fig. 2C, for instance), wherein a sensing current flows substantially perpendicularly with respect to the magnetoresistive effect film (line 1 of the abstract, for instance, i.e., a "tunneling magnetoresistance transducer" has a sensing current thereof flowing substantially perpendicularly with respect to the magnetoresistive effect film), and wherein either an amorphous material or a microcrystalline material is used in a lower shield layer (lines 12-13 in column 11, for instance, i.e., "CoTaZrCr" is an amorphous material, for instance) [as per claim 1]; wherein the lower shield is made of a material of CoZrTa and CoZrTaCr alloy, as a base

(lines 12-13 in column 11, for instance, i.e., "CoTaZrCr" contains both CoZrTa and CoZrTaCr alloy, wherein the CoZrTaCr alloy is a base material with no additives) [as per claim 3].

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dill et al. (US 5,898,548).

Dill teaches the magnetoresistive effect sensor as detailed in paragraph 10, supra. Dill, however, remains silent as to wherein the lower shield crystal grain diameter being "6.2 nm or smaller".

Official notice is taken of the fact that it is notoriously old and well known in the magnetoresistive effect sensor art to modify the parameters of magnetoresistive effect sensor components during the course of routine optimization/experimentation. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the lower shield crystal grain diameter of Dill be 6.2 nm or smaller. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the lower shield crystal grain diameter of Dill be 6.2 nm or smaller since such a range, absent any criticality (i.e., unobvious and/or unexpected result(s)), is generally achievable through routine optimization/experimentation, and since discovering the optimum or workable ranges, where the general conditions of a claim are disclosed in the prior art, involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any criticality (i.e., unobvious and/or unexpected result(s)), the parameter set forth above would have been obvious to a person having ordinary skill in the art at the time the invention was made, *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Pertinent Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Ishiwata et al. (US 6,125,009), which teaches a magnetoresistive effect sensor with a lower shield comprising a magnetic film containing CoM, wherein M is at least one element selected from the group consisting of elements

Ti, V, Cr, Zr, Nb, Hf, Ta, and W, as a component, and wherein the magnetic film has a crystal grain size not more than 10 nm (lines 22-31 in column 16, for instance).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (703) 308-0559. The examiner can normally be reached on Tuesday-Friday 7:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Craig A. Renner
Primary Examiner
Art Unit 2652

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